CLAIMS

1. An area image sensor comprising a plurality of pixels arranged in a lattice shape on an imaging face for photoelectrically converting light of a subject optical image that is focused on the imaging face via an imaging optical system into an electrical signal in each pixel and outputting the electrical signal,

each pixel comprising:

a photoelectric conversion element that converts light rendered through exposure by accumulating electrical charge in accordance with a received light amount into an electrical signal;

a select transistor for outputting to the outside accumulated electrical charge from the photoelectric conversion element following the end of exposure;

one or two or more electrical charge holding circuits provided between the photoelectric conversion element and the select transistor that comprise a capacitor for temporarily holding electrical charge that has accumulated as a result of exposure from the photoelectric conversion element and a transfer transistor for controlling the transfer of the accumulated electrical charge of the photoelectric conversion element to the capacitor; and

a reset transistor provided between the select transistor and the electrical charge holding circuit for discharging residual electrical charge of the capacitor prior to the start

of exposure,

wherein, while determining a horizontal correction coefficient for correcting the level of a photoelectric conversion signal that is outputted from the pixels corresponding with each point located on a horizontal coordinate axis that passes through a predetermined point of the image read area in the imaging face and a vertical correction coefficient for correcting the level of a photoelectric conversion signal that is outputted from the pixels corresponding with each point located on a vertical coordinate axis that passes through a predetermined point of the image read area in the imaging face,

the level of the photoelectric conversion signal of each pixel is corrected by multiplying the photoelectric conversion signal that is outputted by each pixel in the image read area by the horizontal correction coefficient corresponding with the horizontal coordinate of each pixel and by the vertical correction coefficient that corresponds with the vertical coordinate.

2. An area image sensor comprising a plurality of pixels arranged in a lattice shape on an imaging face for photoelectrically converting light of a subject optical image that is focused on the imaging face via an imaging optical system into an electrical signal in each pixel and outputting the electrical signal,

each pixel comprising:

a photoelectric conversion element that converts light rendered through exposure by accumulating electrical charge in accordance with a received light amount into an electrical signal;

a select transistor for outputting to the outside accumulated electrical charge from the photoelectric conversion element following the end of exposure;

one or two or more electrical charge holding circuits provided between the photoelectric conversion element and the select transistor that comprise a capacitor for temporarily holding electrical charge that has accumulated as a result of exposure from the photoelectric conversion element and a transfer transistor for controlling the transfer of the accumulated electrical charge of the photoelectric conversion element to the capacitor; and

a reset transistor provided between the select transistor and the electrical charge holding circuit for discharging residual electrical charge of the capacitor prior to the start of exposure.

3. The area image sensor according to claim 1 or 2, wherein the electrical charge accumulation circuit has a constitution in which one electrode of the capacitor is connected to the output terminal of the transfer transistor and the other electrode is grounded; and

the input terminal of the transfer transistor is connected to the photoelectric conversion element side and one electrode

of the capacitor is connected to the reset transistor side.

4. The area image sensor according to claim 1 or 2, wherein, in each pixel, two of the electrical charge holding circuits are connected in series between the photoelectric conversion element and the select transistor, and a second reset transistor for discharging residual electrical charge of the photoelectric conversion element prior to the start of exposure is connected to the input terminal of the photoelectric conversion element.

5. The area image sensor according to claim 1 or 2, wherein a plurality of signal lines for outputting photoelectric conversion signals from a plurality of pixels arranged in each column is provided in each column;

a plurality of transfer control lines, reset lines, and address lines, which serve to control the ON/OFF of the transfer transistor, the reset transistor and the select transistor respectively of a plurality of pixels arranged in each row, are provided in each row; and

the simultaneous exposure of all the pixels is started by simultaneously outputting reset signals and transfer signals to all of the reset lines and all of the transfer control lines respectively and the simultaneous exposure of all the pixels is subsequently terminated by outputting the transfer signals once again to all of the transfer control lines when a predetermined exposure time has elapsed, whereupon photoelectric conversion signals resulting from the

simultaneous exposure of all the pixels are simultaneously outputted to each row from the plurality of pixels arranged in each row by sequentially outputting select signals to the address lines of each row in sync with a plurality of horizontal synchronization signals outputted in sync with a vertical synchronization signal.

6. The area image sensor according to claim 1 or 2, wherein a plurality of signal lines for outputting photoelectric conversion signals from a plurality of pixels arranged in each column is provided in each column;

a plurality of transfer control lines, reset lines, and address lines, which serve to control the ON/OFF of the transfer transistor, the reset transistor and the select transistor respectively of a plurality of pixels arranged in each row, are provided in each row; and

simultaneous exposure of all the pixels of a time that corresponds to the cycle of a vertical synchronization signal is repeated by simultaneously outputting a reset signal and transfer signal to all of the reset lines and all of the transfer control lines respectively in sync with the vertical synchronization signal, and photoelectric conversion signals resulting from the simultaneous exposure of all the pixels of one exposure period earlier are simultaneously outputted to each row from the plurality of pixels arranged in each row by sequentially outputting select signals to the address lines of each row in sync with a plurality of horizontal synchronization

signals outputted in sync with a vertical synchronization signal during each exposure period.

7. An area image sensor comprising a plurality of pixels arranged in a lattice shape on an imaging face for photoelectrically converting light of a subject optical image that is focused on the imaging face via an imaging optical system into an electrical signal in each pixel and outputting the electrical signal, wherein, while determining a horizontal correction coefficient for correcting the level of a photoelectric conversion signal that is outputted from the pixels corresponding with each point located on a horizontal coordinate axis that passes through a predetermined point of the image read area in the imaging face and a vertical correction coefficient for correcting the level of a photoelectric conversion signal that is outputted from the pixels corresponding with each point located on a vertical coordinate axis that passes through a predetermined point of the image read area in the imaging face,

the level of the photoelectric conversion signal of each pixel is corrected by multiplying the photoelectric conversion signal that is outputted by each pixel in the image read area by the horizontal correction coefficient corresponding with the horizontal coordinate of each pixel and by the vertical correction coefficient that corresponds with the vertical coordinate.

8. The area image sensor according to claim 1 or 7, wherein a predetermined point of the image read area is the point where the pixel for which a reference received light amount from the imaging optical system is maximum is located.

9. The area image sensor according to claim 1 or 7, wherein the horizontal correction coefficient is determined on the basis of the reciprocal number of the ratio of a reference received light amount of each pixel arranged on the horizontal coordinate axis that passes through the predetermined point with respect to the reference received light amount of the pixel located at the predetermined point; and

the vertical correction coefficient is determined on the basis of the reciprocal number of the ratio of the reference received light amount of each pixel arranged on the vertical coordinate axis that passes through the predetermined point with respect to the reference received light amount of the pixel located at the predetermined point.

10. The area image sensor according to claim 1 or 7, comprising:

a plurality of A/D conversion means provided in each column that perform conversion to a digital signal by comparing the level of an analog photoelectric conversion signal that is outputted by a plurality of pixels arranged in each column with a predetermined reference level;

first reference level setting means that set, for the A/D conversion means, a different reference level for each row

in accordance with a value that is associated with the vertical correction coefficient when a photoelectric conversion signal is outputted by a plurality of pixels arranged in each row in row units; and

second reference level setting means that set, for each of the A/D conversion means, a different reference level in accordance with a value that is associated with the horizontal correction coefficient.

11. The area image sensor according to claim 10, wherein the horizontal setting means set a different reference level for each of the A/D conversion means by dividing the reference voltage by means of resistors.

12. The area image sensor according to claim 1 or 7, comprising:

a plurality of A/D conversion means provided in each column that perform conversion to a digital signal by comparing the level of an analog photoelectric conversion signal that is outputted by a plurality of pixels arranged in each column with a predetermined reference level;

first reference level setting means that set, for the A/D conversion means, a different reference level for each row in accordance with a value that is associated with the vertical correction coefficient when an analog signal is outputted by a plurality of pixels arranged in each row in row units; and

second reference level setting means that count the output of each of the A/D conversion means with a predetermined count

range serving as a reference and set a different count range for each of the A/D conversion means in accordance with a value that is associated with the horizontal correction coefficient.

13. The area image sensor according to claim 1 or 7, comprising:

horizontal correction coefficient storage means that pre-store a horizontal correction coefficient corresponding with each point located on a horizontal coordinate axis that passes through a predetermined point of the image read area;

vertical correction coefficient storage means that pre-store a vertical correction coefficient corresponding with each point located on a vertical coordinate axis that passes through a predetermined point of the image read area; and

multiplication means that multiply a photoelectric conversion signal that is outputted by each pixel in the image read area by a horizontal correction coefficient corresponding with a horizontal coordinate of the pixel that is stored in the horizontal correction coefficient storage means and by a vertical correction coefficient corresponding with a vertical coordinate of the pixel that is stored in the vertical correction coefficient storage means.

14. The area image sensor according to claim 13, wherein the horizontal correction coefficient storage means store the horizontal correction coefficient by thinning the horizontal correction coefficient; and

the vertical correction coefficient storage means store

the vertical correction coefficient by thinning the vertical correction coefficient.